REMARKS

Claims 28 – 40 are in the application for consideration.

Entrance of this amendment in the application is requested since the amendment made in claim 28 is believed to place the claims in condition for allowance or at least reduce the number of issues for appeal. Further, reconsideration of the application is requested in view of the amendment made in claim 28 and the remarks appearing below herein

1. Applicants acknowledge the courtesies extended by the examiner in the telephonic interview held with applicants' undersigned attorney. No agreements were reached in that interview.

2. Claim 28 has been amended in accordance with the examiner's suggestion to recite specifically that the volume recording medium "is essentially free from materials capable of free radical polymcrization".

The amendatory matter is fully supported by the disclosure of the application. See, for example, page 1, lines 7 – 11 of the specification.

3. Claims 28 - 40 have been rejected under the first paragraph of 35 U.S.C. § 112 as failing to comply with the written description requirement. In support of the rejection the examiner has stated that the limitation of p to 3 or more in formula (IV) does not have any basis in the application as filed.

Applicants request reconsideration of this ground of rejection. The limitation in formula (IV) of p to 3 or more is supported by the disclosure of the application as originally filed.

Initially it is pointed out that formula (IV) appears specifically only in claim 36 upon which claims 37 and 38 are dependent. Thus, the subject matter recited in claims 28 – 35, 39 and 40 does not fail to comply with the written description requirement because of the issue relating to the amendment of formula (IV). The

subject matter of claims 28 – 35, 39 and 40 clearly complies with the written description requirement.

With respect to the subject matter of claims 36 – 38 it is submitted that the amendments made previously to the specification and claim 36 comply with the requirements of Section 112. At page 6, lines 23 and 24, the specification states that "[A] variety of tri- tetra- and higher polysiloxanes have been found useful as the polyfunctional monomer in the present medium and process." The specification goes on to specify various such polysiloxanes including the monomers of formula (II), which have from 3 to 10 siloxane groups (n = 3 to 10), and those of formula (III) which have 3 siloxane groups. At page 7, lines 23 and 24, the specification states "[A] second preferred group of polyfunctional monomers ....are those of the formula" followed by formula (IV) which appears at the top of page 8.

In formula (IV) the moiety $[SiR^7R^8O]_P$ is the epoxide moiety since R^8 is defined as a "monovalent epoxy functional group having 2 – 10 carbon atoms". Originally, as mentioned above, the subscript p was defined as being any integer. However, it is apparent that the compounds defined by formula (IV) can only be polyfunctional where p is at least 3.

Thus, the amended definition of p is supported by the application as originally filed. In order to comply with the written description requirement of the first paragraph of Section 112 it is not necessary that the exact language in the claims appear in the specification. It is sufficient that the language recited in the claims be supported by the disclosure of the specification in a clear manner. Here, given the original definition of "p" as an integer and the additional fact that formula (IV) clearly is stated as defining polyfunctional siloxane monomers and that such monomers could be polyfunctional only where p is 3 or more, the amendatory language is clearly supported by the original disclosure and amended claim 36, together with dependent claims 37 and 38 comply with the written description requirement of Section 112.

The examiner has referred to the disclosure of U.S. Patent 5,523,374 which shows a polysiloxane monomer (column 7, lines 51 – 67) having from 6 to 11 siloxane units. The disclosure of the particular polysiloxane monomer in the '374 patent is in the context of preferred siloxanes for use in the compositions disclosed

therein. That teaching does not in any way indicate that the number of siloxane units in formula (IV) of the present application should be the same.

In summary, it is requested that this ground of rejection be reconsidered and withdrawn.

4. Claims 28 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Canadian Patent 995843 ("Watt"). In support of the rejection the examiner has referred to Example 18 of Watt.

Applicants continue to rely on the arguments made with respect to Watt in their previous response in this application. These arguments will not be repeated for the sake of brevity.

The composition described in Example 18 of Watt includes allyl glycidyl ether, a material capable of free radical polymerization. For this reason, as well as the other arguments advanced previously, it is submitted that the subject matter of amended claim 28 and dependent 30 is patentably distinguishable over the teaching of Example 18 of Watt.

Reconsideration of this ground of rejection and withdrawal thereof from the application are requested.

5. Claim 28 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Watt. In support of this ground of rejection the examiner has referred to Example 3 of the reference and has pointed out that the addition of a binder is disclosed as rendering the composition aqueous developable..

Watt does not disclose the addition of a binder to render compositions aqueous developable and Example 3 of this reference does not recite a composition which includes an epoxide of bisphenol A, an Epoxy cresol novolak and a stilbene iron tosylate compound.

As a result of a telephone interview with the examiner, it appears that the rejection was intended to be based on United States Patent No. 5,124,233 ("Meier et al.") instead of Watt. The sections of the reference which are pointed out in the Office Action, namely Example 3 in column 10 and the text from column 5, line 64 to column 6, line 2, coincide with the disclosure of Meier et al.

Applicants traverse this ground of rejection. In order to form stable volume holograms, the claimed compositions of applicants require a particular type of binder material. The binder, as recited in claim 28, is one which does not inhibit cationic polymerization and which has a refractive index significantly different than that of the polymerized difunctional or polyfunctional monomers or oligomers.

The teaching of Meier et al. does not suggest to those skilled in the art to add to any composition the specific type of binder material recited in claim 28. The compositions of Meier et al. are taught for use as photoresists. The teaching to add a binder to render the composition aqueous developable has to be interpreted in the context of the overall disclosure.

There is no suggestion in Meier et al. to use such compositions for the formation of volume holograms and there is no suggestion to incorporate into such a composition the type of binder material necessary to provide a composition which is suitable to form volume holograms.

Reconsideration of this ground of rejection and withdrawal thereof are respectfully requested.

6. Claims 28 –31, 39 and 40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,702,846 ("Sato et al.") in view of U.S. Patent 4,950,567 ("Keys et al.").

It is believed that this ground of rejection has been obviated by the amendment made in claim 28 (as indicated by the examiner) since, *inter alia*, Sato et al. describes compositions which include both a cationic polymerizable compound and a radical polymerizable compound.

7. Claims 28 –31, 39 and 40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 97/13183 ("Dhal et al.") in view of U.S. Patent 5,698,345 ("Ohe et al.") and Keys et al.

Applicants continue to rely on the arguments made with respect to these references in their previous response in this application. These arguments will not be repeated for the sake of brevity.

The composition of Ohe et al. includes an aliphatic monomer which has at least one ethylenically unsaturated bond which is capable of radical polymerization. See, for example, the Abstract. For this reason, as well as the other reasons advanced during prosecution, it is submitted that one skilled in the art would find no suggestion in the reference to modify the teaching of Dhal et al in order to arrive at applicants' claimed volume holographic recording media.

Similarly, Keys et al. teaches a recording medium which has solid ethylenically unsaturated carbazole monomers which typically contain the ethylenically unsaturated group in the terminal position. Such monomers are polymerizable by free radical polymerization. Again, those skilled in the art would find no suggestion in Keys et al. to modify the teaching of the primary reference.

In summary, Dhal et al. viewed alone or in combination with the secondary references, does not teach the presently claimed subject matter within the meaning of 35 U.S.C. § 103.

8. Claims 28 –31, 39 and 40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dhal et al in view of Ohe et al, Keys et al and Sato et al.

It is believed that this ground of rejection has been overcome by the amendment made in claim 28 for the reasons discussed above with respect to Ohe et al., Keys et al. and Sato et al.

9. Claims 28 – 40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dhal et al. in view of Ohe et al., Keys et al.. and J. Polymer Sci ("Crivello et al.") and/or EP 0 391 162 ("Eckberg et al.").

Applicants traverse this ground of rejection for the same reasons advanced previously with respect to Dhal et al., Ohe et al. and Keys et al. and further because both Crivello et al. and Eckburg et al. do not teach or suggest volume holographic compositions.

Reconsideration of this ground of rejection and withdrawal thereof are respectfully requested.

In summary, applicants have discovered that volume holographic recording media with a combination of difunctional epoxide monomers or oligomers and polyfunctional epoxide monomers or oligomers record stable volume holograms with a much lower energy fluence thus rendering these media particularly suitable for use in digital data storage applications. The data submitted by the Affidavit of David A. Waldman, one of the applicants, in the previous response filed by applicants show the unexpected results obtained according to the invention. The unexpected much faster stable volume holographic formation provided by the recording media of the invention is critical for digital holographic data storage applications.

Claim 28 has been amended in accordance with the suggestion of the examiner in a diligent effort to advance prosecution in the application and at the very least to reduce the issues presented for appeal. Thus, entrance of this amendment in the application and reconsideration of the claims are respectfully requested.

Further, it is believed that the claims have been shown to be proper in form for allowance and in substance to be patentably distinguishable over the references of record. Reconsideration of the application and allowance of the claims are respectfully solicited.

Respectfully submitted,

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Enclosure